APPENDIX I

Temperature Monitoring Data and Evaluation of Relevant Criteria
For MCR Steelhead CH Streams within the Dark Canyon and Fawn Springs Allotments

Stream temperature is an important factor affecting distribution and abundance of salmonids within the Subbasin. Water temperatures influence water chemistry, as well as every phase of salmonid life history. Optimal temperatures for steelhead are 50˚ to 61˚ F (10˚ to 16˚ C), and the lethal temperature is approximately 77˚ F (25˚ C). Within the Subbasin, high stream temperatures occur near the end of July or the beginning of August and coincide with low stream flows and warm daytime temperatures. By the end of August, stream temperatures are typically dropping.

A variety of water temperature standards/desired conditions/criteria are addressed by the MNF when designing land management actions and evaluating their effects. They are described below.

Current Condition & Forest Plan Standards & Guidelines

The Forest Plan water temperature standard and RMO directs the Forest to meet state water quality standards and prevent measurable increases in water temperature (1990 Forest Plan Watershed S&G-2, 1995 PACFISH Water Temperature RMO), and maintain maximum water temperatures below 64°F within migration and rearing habitat and below 60°F within spawning habitats (PACFISH). The Forest Plan Watershed Standards and Guidelines are:

> **2. Water Quality Standards and BMP's.** Meet Water Quality Standards for waters of the States of Oregon (Oregon Administrative Rules, Chapter 340-41) and Idaho through planning, application, and monitoring of Best Management Practices (BMP's) in conformance with the Clean Water Act, regulations, and federal guidance issued there to.
>
> **7. Stream Temperatures.** Prevent measurable temperature increases in Class I Streams. Temperature increases on SMU Class II (and fish bearing Stream Management Unit Class III) streams will be limited to the criteria in State standards. Temperatures on other streams may be increased only to the extent that water quality goals on downstream, fish-bearing streams will still be met. Normally, stream shade management on Class III streams will differ little from treatment on Class II streams

Oregon State Water Quality Standards

In addition to meeting the Forest Plan standard, the Forest must meet Oregon water quality standards under the Clean Water Act. EPA approved new water quality standards for Oregon in March 2004. Streams in the aquatic effects analysis are considered "salmon and trout rearing and migration habitat" for Oregon water temperature standards. Therefore, the following water temperature standard applies:

The seven-day-average maximum temperature of streams identified as having salmon and trout rearing and migration use; may not exceed **17.8** degrees Celsius (**64.4** degrees Fahrenheit).

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Amendment 29 DFC

1. Chinook and/or Westslope cutthroat trout spawning & rearing habitat - 7 Day Mean Max 55°F (12.8°C)
2. All other John Day Basin streams – 7 Day Mean Max 64°F (17.8°C) - *Amendment 29 specifies DFCs for temperature to result in compliance with Oregon State Water Quality Standards, including instantaneous reading at any time of less than 68°F (20°C) in all anadromous streams without Chinook, bull trout, or Westslope cutthroat trout spawning and rearing habitat. This water quality standard has been revised since Amendment 29 was issued, thus the revised standard is applied.*

PACFISH RMO

1. No measurable increase in 7 Day Mean Max – *MNF data insufficient to determine whether this RMO is being met.*
2. Migration & rearing habitat - 7 Day Mean Max Below 64°F (17.8°C)
3. Spawning habitat - 7 day Mean Max Below 60°F (15.6°C)

Matrix of Pathways and Indicators:

STEELHEAD (S)

1. Properly Functioning (PF): 7 Day Mean Max 50-57°F (10-13.9°C)
2. At Risk (AR): 7 Day Mean Max - Spawning habitat 57-61°F (13.9-16.1°C), Migration & rearing habitat 57-64°F (13.9-17.8)
3. Not Properly Functioning (NPF): 7 Day Mean Max - Spawning habitat >61°F (16.1°C), Migration & rearing habitat >64°F (17.8°C)

Temperature Monitoring Data and Analysis

Table I-1 presents available water temperature monitoring data for streams in the Dark Canyon and Fawn Springs allotments. Dates for monitoring vary from 1999 to 2005. The table also displays whether or not the temperature data meets or fails to meet each standard described above: 1) State water quality standards; 2) Amendment 29 DFC; 3) PACFISH RMO; and, 4) NMFS MPI. The location of the Dark Canyon and Fawn Springs allotment temperature monitoring sites are displayed within Figures 1 and 2, respectively. Four streams; Middle Fork Canyon Creek, East Fork Canyon Creek, Canyon Creek and Wickiup Creek exceed the 7 day mean maximum of 64 degrees. All streams are designated critical habitat except Wickiup Creek. Wall Creek is a designated critical habitat stream, but does not have temperature data. Canyon Creek and East Fork Canyon Creek are on the State of Oregon 303d list for water temperature.

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Table 1. Available Temperature Data and Relevant Criteria for Steelhead Critical Habitat Streams in the Dixie and Roundtop Allotments

Stream	**Pasture / Allotment**	**Elevation (feet)**	**Years Analyzed**	**Mean Yearly Max of 7 Day Rolling Means of Daily Max (°F)** (7 Day Mean Max)	**Daily Max Over 64°F** (Mean Days Per Year)	**State Water Quality Standards** (Meet/Fail)	**303d Listed** (Y/N)	**Amendment 29 DFC** (Meet/Fail)	**PACFISH RMO** (Meet/Fail)	**MPI** (PF,AR,NPF)
EF Canyon	G4 & Lake/ Fawn Springs	4510	1999-2000	66.8	21.5	Fail 1	Y	Fail 2	Fail 2, 3	FAR S
Canyon	Canyon/ Dark Canyon	5320	1999-2000	62.2	1	Meet	Y	Meet	Meet 2 Fail 3	NPF S
Canyon	Canyon/ Dark Canyon	4620	1999	70.4	49	Fail 1	Y	Fail 2	Fail 2, 3	FAR S
Canyon	Canyon/ Dark Canyon	4670	2000	64.7	7	Fail 1	Y	Fail 2	Fail 2, 3	FAR S
Canyon	Canyon/ Dark Canyon	4330	1999-2005	74.3	69	Fail 1	Y	Fail 2	Fail 2, 3	FAR S
Crazy	Canyon/ Dark Canyon	5180	1999-2000	51.0	0	Meet	N	Meet	Meet	PF S
Crazy	Canyon/ Dark Canyon	4670	2000	61.2	0	Meet	N	Meet	Meet 2 Fail 3	NPF S
MF Canyon	Canyon/ Dark Canyon	5200	1999-2000	63.4	2.5	Meet	N	Meet	Meet 2 Fail 3	NPF S
MF Canyon	Canyon/ Dark Canyon	4620	2000	72.4	57	Fail 1	N	Fail 2	Fail 2, 3	FAR S
MF Canyon	Canyon/ Dark Canyon	4640	1999	66.2	18	Fail 1	N	Fail 2	Fail 2, 3	FAR S
Wickiup	Canyon/ Dark Canyon	4320	2000	73.1	61	Fail 1	N	Fail 2	Fail 2, 3	FAR S
Canyon	Wickiup/ Dark Canyon	4410	2002	73.0	47	Fail 1	Y	Fail 2	Fail 2, 3	FAR S
Canyon	Wickiup/ Dark Canyon	4390	2005	65.6	23	Fail 1	Y	Fail 2	Fail 2, 3	FAR S
MF	Wickiup/	4340	2000	71.8	56	Fail 1	N	Fail 2	Fail 2, 3	FAR S

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Canyon	Dark canyon									

State Water Quality Standards:

1. All streams identified as having anadromous fish passage and salmonid rearing use for Designated Beneficial Use purposes. 7 Day Mean Max 64°F (17.8°C)

Amendment 29 DFC:

3. Chinook and/or Westslope cutthroat trout spawning & rearing habitat - 7 Day Mean Max 55°F (12.8°C)
4. All other John Day Basin streams – 7 Day Mean Max 64°F (17.8°C) - *Amendment 29 specifies DFCs for temperature to result in compliance with Oregon State Water Quality Standards, including instantaneous reading at any time of less than 68°F (20°C) in all anadromous streams without Chinook, bull trout, or Westslope cutthroat trout spawning and rearing habitat. This water quality standard has been revised since Amendment 29 was issued, thus the revised standard is applied.*

PACFISH RMO

4. No measurable increase in 7 Day Mean Max – *MNF data insufficient to determine whether this RMO is being met.*
5. Migration & rearing habitat - 7 Day Mean Max Below 64°F (17.8°C)
6. Spawning habitat - 7 day Mean Max Below 60°F (15.6°C)

Matrix of Pathways and Indicators:

STEELHEAD (S)

4. Properly Functioning (PF): 7 Day Mean Max 50-57°F (10-13.9°C)
5. At Risk (AR): 7 Day Mean Max - Spawning habitat 57-61°F (13.9-16.1°C), Migration & rearing habitat 57-64°F (13.9-17.8)
6. Not Properly Functioning (NPF): 7 Day Mean Max - Spawning habitat >61°F (16.1°C), Migration & rearing habitat >64°F (17.8°C)

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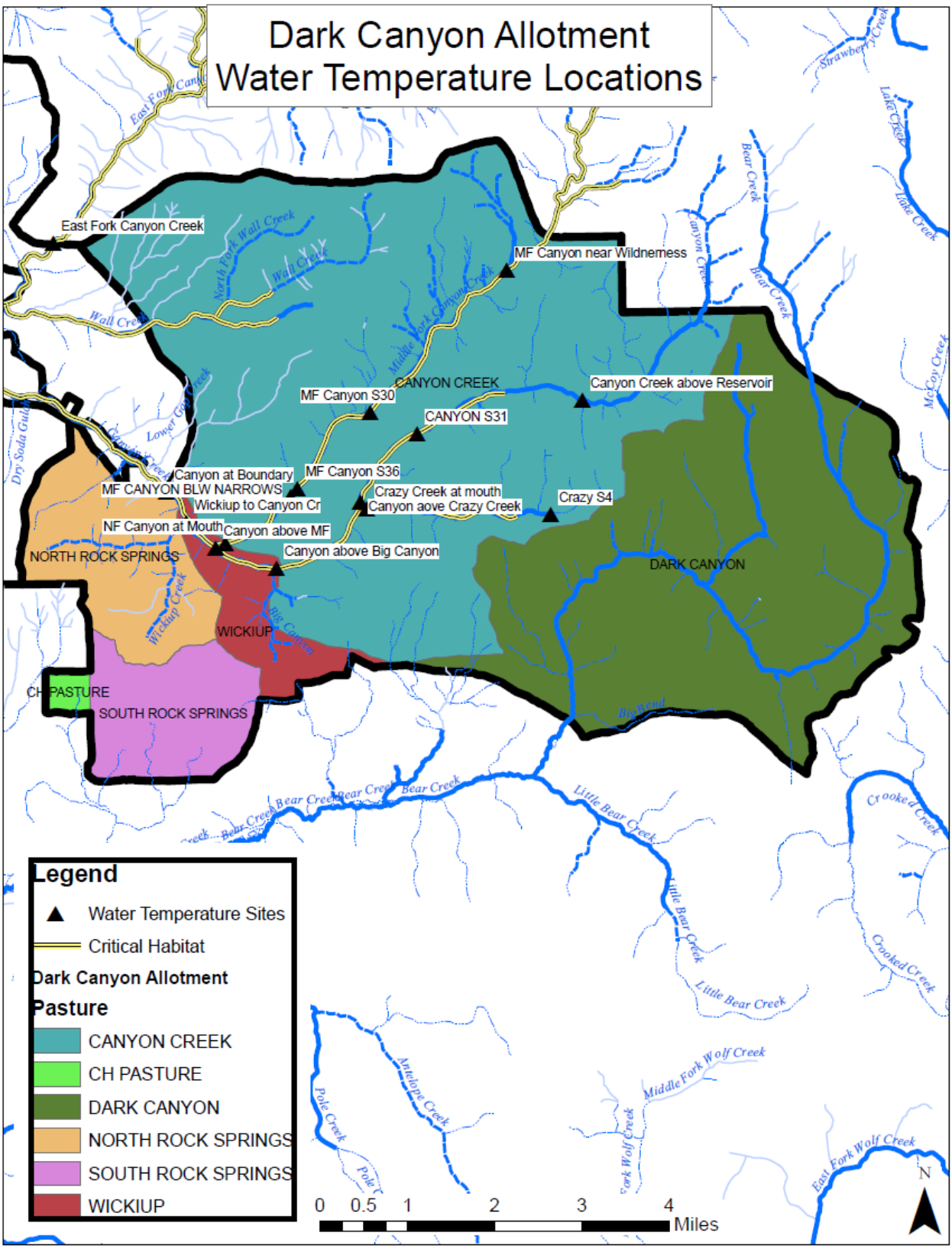

Figure 1. Stream Temperature Monitoring Sites within the Dark Canyon Allotment.

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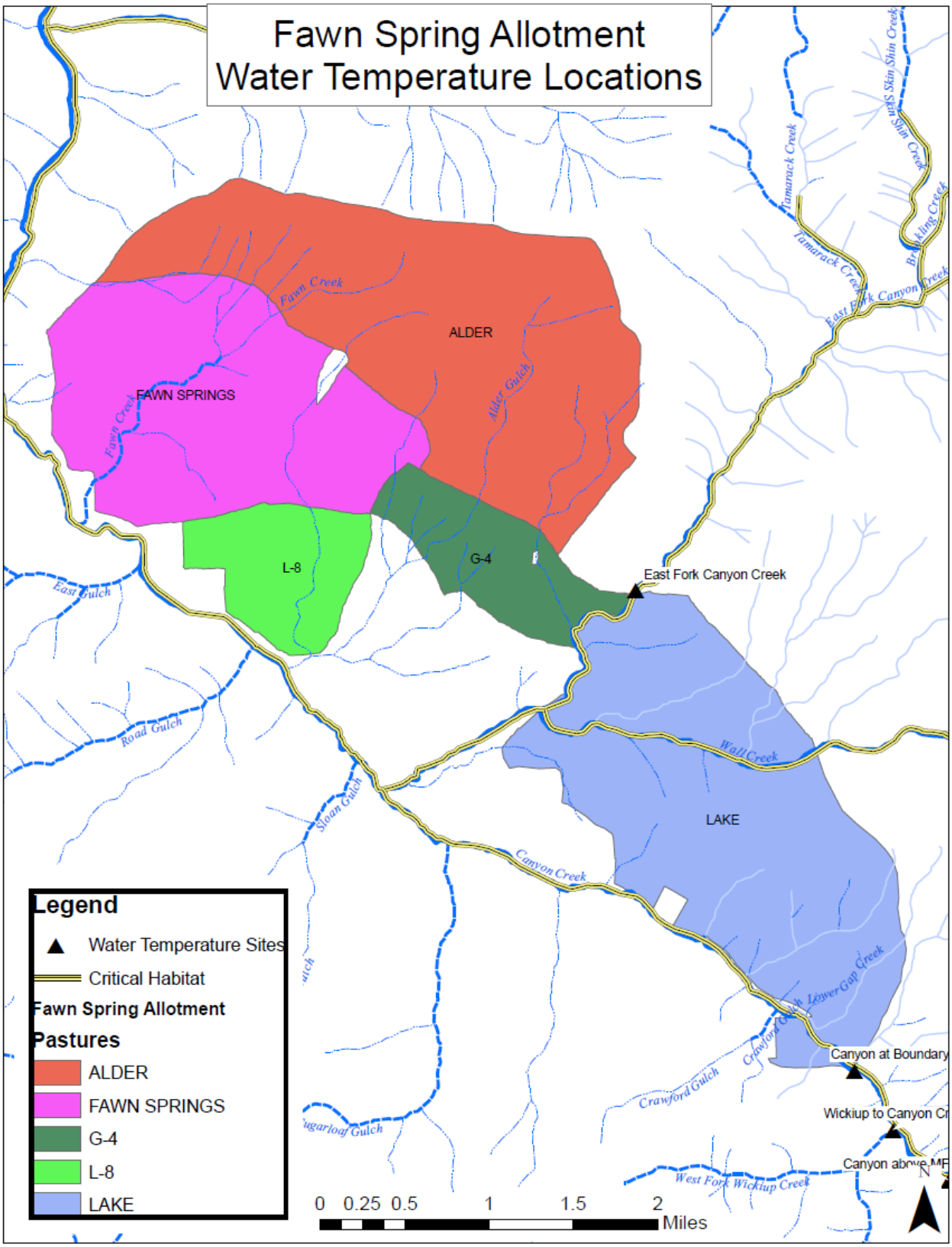

Figure 2. Stream Temperature Monitoring Sites within the Fawn Springs Allotment.